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Prediction of Autonomy Support, Psychological Mediators and Academic Motivation on Basic Competences in Adolescent Students

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Abstract

The purpose of this study was to examine the prediction of autonomy support, psychological mediators and self-determined academic motivation on basic competences. A sample of 405 adolescent students aged between 12 and 16 was used to measure autonomy support, psychological needs, self-determined motivation and basic competences. The results supported the factorial structure of the scale and showed that it was valid and reliable for measuring basic competences. Autonomy support from teachers, peers, fathers and mothers, psychological mediators and self-determined motivation predicted basic competences.

Keywords: Autonomy support, psychological mediators, social factors, self-determined motivation, basic competences.

Resumen

El objetivo de este estudio fue comprobar el poder de predicción del soporte de autonomía, los mediadores psicológicos y la motivación académica autodeterminada sobre las competencias básicas. Se utilizó una muestra de 405 estudiantes adolescentes con edades comprendidas entre los 12 y 16 años a los que se les midió el soporte de autonomía, las necesidades psicológicas, la motivación autodeterminada y las competencias básicas. Los resultados apoyaron la estructura unifactorial y mostraron que la escala de competencias básicas era válida y fiable para medir su objetivo. El soporte de autonomía del docente, los iguales, el padre y la madre, los mediadores psicológicos y la motivación académica autodeterminada predijeron las competencias básicas

Palabras clave: Soporte de autonomía, mediadores psicológicos, factores sociales, motivación autodeterminada, competencias básicas.

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Introduction

Knowledge of social factors and motivational processes contributes to improving the perspective of success in school activities, and to developing meaningful learning in students (Fernández, Anaya, & Suárez, 2011; Miñano & Castejón, 2011; Regueiro, Suárez, Valle, Núñez, & Rosário, 2014; Rodríguez, 2009; Tapia, 2005). Society requires this learning to be interconnected so that students become competent and able to deal with everyday situations (Garaigordobil & Martínez-Valderrey, 2014; García & Martín, 2011; Gil, 2012). If *basic competences* are included in the educational framework, a common core is provided and learning is transferred to personal and social development. According to Blázquez (2009), any competence should be applied in a wide range of contexts in order to achieve high personal and social results and lead to successfully overcoming complex demands. To do so, competences have a transversal nature, and try to respond to behavioral, cognitive and affective variables in each school subject (Boyatzis, Goleman, & Hay/McBer, 1999; Boyatzis, Goleman, & Rhee, 2000; Cherniss, 2000; Coombs-Richardson, 1999; Saarni, 1998; Zins, Elias, Greenberg, & Weissberg, 2000). The acquisition of *basic competences* has become the subject of fundamental research in the context of school education because of the high interest in embracing the values, emotions, knowledge and motivations that enable students to solve problems arising in every situation (Monarca & Rappoport, 2013; Stiefel, 2008).

According to Vallerand (1997), the consequences that favor behavior, cognition and affectivity can depend on the social factors a student engages in. One of these social factors is how a student perceives the *autonomy support* given by teachers, parents and peers. So, motivations from the different social groups make it possible to choose, and reduce the pressure on performance and external control of behavior (Cerezo, Casanova, De la Torre, & Carpio, 2011; Hagger et al., 2007; Hernando, Oliva, & Pertegal, 2012; Standage, Duda, & Ntoumanis, 2006), which involves regulating behavior by considering the interests and values established by the students themselves (Bartholomew, Ntoumanis, & Thogersen-Ntoumani, 2009). In this context, Ryan and Deci (2000) indicated that frustration in the sensation of autonomy is responsible for a lack of satisfaction with life. This is illustrated by the fact that children experience better social adjustment and competence when their parents promote autonomy and play down firm control (Allen, Hauser, Eickholt, Bell, & O'Connor, 1994; Oliva, 2006). However, children have more behavioral problems when their parents use strategies

of psychological control that make it difficult to develop autonomy (Parra & Oliva, 2006). Also, the different perceptions adolescents have of their fathers and mothers and the educational style they use seem to condition whether there is more or less communication (Fernandez, Linares, & Ernest, 2012; Montañés, Bartolomé, Montañés, & Parra, 2008; Rodrigues, Veiga, Fuentes, & García, 2013). To be exact, the mother's communicative style is characterized by greater emotional and affective closeness, while the father's focuses more on family rules and future life (Parra & Oliva, 2002). Perceived autonomy has been related to what extent parents explain the reasons for their behavior to their children, and it is the lack of explanation that tends to cause negative effects on the development of autonomy (Moraleda, 1994). The form of behavior that students learn in the relationship with their parents is transferred to their relationship with their peers, so autonomy support from parents presents a positive relation with autonomy support from peers (Iborra, Tomás, & Serra, 2009; Meeus, Oosterwegel, & Vollebergh, 2002; Zacarés et al., 2009).

In this sense, a teaching style that facilitates a student's autonomy has become highly important in research over the last few decades (Bieg, Backes, & Mittag, 2011; Halusic & Reeve, 2009; McLachlan & Hagger, 2010; Conde, Sáenz-López, & Moreno-Murcia, 2012; Oğuz, 2013; Reeve, 2009; Reeve et al., 2014; Sheldon, Abad, & Omoile, 2009; Su & Reeve, 2011). This type of learning environment stimulates students internal motivational resources, benefits are obtained in contrast to more controlling styles (Reeve & Tseng, 2011; Sierens, 2010), greater perceived competence (Deci, Schwartz, Sheinman, & Ryan, 1981), intrinsic motivation (Reeve, Nix, & Hamm, 2003; Ryan & Grolnick, 1986), creativity (Koestner, Ryan, Bernieri, & Holt, 1984), an increase in conceptual comprehension (Benware & Deci, 1984), greater commitment (Reeve, Jang, Carrell, Barch, & Jeon, 2004), positive emotionality (Patrick, Skinner, & Connell, 1993), an improved academic performance (Boggiano, Flink, Shields, Seelbach, & Barrett, 1993) and greater academic persistence, instead of dropping out of school (Vallerand, Fortier, & Guay, 1997).

Based on the self-determination theory (SDT; Deci & Ryan, 1985, 1991), Vallerand (1997) studied how social factors could favor or hinder motivation depending on the satisfaction of the basic psychological needs of competence, autonomy and relatedness. Social factors are related to *self-determined motivation* where control of behavior depends on a person's efforts to feel they are the origin of their actions (Deci & Ryan, 1991). This being the case, social factors can either contribute to or impede the

satisfaction of *psychological needs* (Diseth, Danielsen, & Samdal, 2012; Domènech & Gómez, 2011), and promote forms of *self-determined motivation* which result in positive cognitive, affective and behavioral consequences (Vallerand, 2007).

According to the SDT, social contexts that transmit feelings of competence favor intrinsic motivation when they are accompanied by a sensation of autonomy (Moreno-Murcia, & Vera, 2011; Sánchez-Oliva, Viladrich, Amado, González-Ponce, & García-Calvo, 2014). Different studies (Ryan & Conell, 1989; Vallerand, Blais, Brière, & Pelletier, 1989) have shown that identified and intrinsic regulation of behavior is related to a student's perception of autonomy and satisfaction while in class, whereas external and introjected motivation are related to the perception of control and anxiety.

This study aimed to examine the power of prediction that *autonomy support, psychological mediators and self-determined academic motivation* have on basic competences.

In the context of the SDT and the model of extrinsic and intrinsic motivation by Vallerand, the hypothesis is formed that *autonomy support, psychological mediators and self-determined academic motivation* would predict the *basic competences* in students.

Method

Participants

The sample consisted of 405 Spanish High School students, from different state schools in the province pf Alicante (Spain), with an average socio-cultural level. The participants were aged between 12 and 18 (M = 15.40, SD = 1.60). The distribution percentage per sex was 52.34% for girls (n = 212) and 47.66% for boys (n = 193). Random sampling was used (Azorín & Sánchez Crespo, 1986)

Measures

Social autonomy support from teachers, mothers, fathers and peers. We used a modified version of the *Learning Climate Questionnaire* (LCQ) by Williams and Deci (1996), translated and adapted by Núñez, León, Grijalvo and Martín-Albo (2012). It evaluates autonomy support from teachers, peers and family (mother and father) in the social context. It consists of 15 items (e.g. "Tries to understand my point of view before explaining a new way to do things") which are valued according to the heading ("My teachers", "My friends…", "My mother…", "My father"). Responses are scored on a Likert scale from 1 ("I strongly disagree") to 7 ("I strongly agree"). Cronbach's Alpha was .87 for teachers, .93 for peers, .95 for mothers and .95 for fathers.

Psychological mediators. We used the Spanish version of the *Échelle de Satisfacción des Besoins Psychologiques* by Gillet, Rosnet, & Vallerand (2008) in the educational context (León, Domínguez, Núñez, Pérez, & Martín-Albo, 2011). The scale consists of 15 items referring to *academic competence* (e.g. "I have the feeling I'm doing well"), to *academic autonomy* (e.g. "I generally feel free to express my opinions"), and *academic relatedness* (e.g. "I feel at ease with the people I relate to"). Responses were given on a Likert scale from 1 ("I totally disagree") to 5 ("I totally agree"). In this study all mediators were considered together and internal consistency was .78.

Self-determined academic motivation. Academic motivation was measured using the Spanish version of the *Academic Motivation Scale* High School Version (AMS-HS-28) (Vallerand, Pelletier, Blais, & Brière, 1992) validated for secondary education (Suárez, 2008). The academic motivation scale (AMS) is made up of 28 items, preceded by the question "Why do you go to school?", and has seven subscales with four items each: *amotivation* (e.g. "I don't know why I go to school and to be honest I don't care"), *external regulation* (e.g. "So I can earn a better salary afterwards"), *introjected regulation* (e.g. "Because when I do tasks well in class I feel important"), *identified regulation* (e.g. "Because it'll help me make better decisions about my professional career"), *intrinsic motivation towards knowledge* (e.g. "Because through my studies I can continue learning many things that interest me"), *intrinsic motivation towards achievement* (e.g. "Because of the satisfaction I feel when I overcome difficult academic activities") and *intrinsic motivation towards stimulating experiences* (e.g. "Because I really like going to class"). The responses are scored on a 7 point Likert scale, from 1 ("I totally disagree") to 7 ("I totally agree"). Self-determined motivation was evaluated using the self-determination index (SDI), which has been shown to be valid and reliable in different studies (Chantal, Robin, Vernat, & Bernache Asollant, 2005; Kowal & Fortier, 2000), and is calculated using the following formula: (2 x (IM knowledge + IM execution + IM stimulation / 3) + (ME identified) – ((ME external + ME introjected) / 2) – (2 x amotivation) (Vallerand, 1997). Cronbach's Alpha was .87.

Basic competences. A scale was designed to determine *student's basic competences*. To do so, we considered the Organic Law 8/2013 9th December to improve education quality (LOMCE), which establishes two basic competences (linguistic-mathematical and scientific-technological) and five transversal competences (digital, learning to learn, social sciences and civic education, initiative and entrepreneurship and cultural awareness and expression). It consists of nine

items (e.g. "to be autonomous and have personal initiative to face challenges and make decisions about my life") and it was preceded by the heading "Does what I'm taught at high school enable me to …?" The responses were given on a Likert scale of 1 ("I totally disagree") to 7 ("I totally agree"). Internal consistency for this dimension was .82.

Procedure

The period for administrating the questionnaires was arranged once the appropriate authorization was given from the school board at the chosen centers (state schools in the province of Alicante) and, as participants were minors, from parents/guardians too. The questionnaires were completed during tutorials under the supervision of the lead researcher. It is important to note that the group tutor was also present. The time required for completing the questionnaire was approximately 20 minutes.

Data analysis

The first step was to calculate the descriptive statistics of all the target variables (averages and standard deviations), and internal consistency for each factor was analyzed using Cronbach's Alpha and bivariate correlations. The content validity of the basic competences scale was made through the content validity coefficient (CVc). For construct validity, a stepwise linear regression analysis was made to test the prediction of basic competences through *autonomy support, psychological mediators and self-determined motivation*. SPSS 21.0 and AMOS 21.0 software was used to analyze data.

Results

Prior analyses

To validate the content, items from the basic competences scale were analyzed by two specialists in research methodology and a specialist in secondary education. They responded on a Likert scale of 5 points about the clearness of language, pertinence and theoretical relevance for each item. The content validity coefficient (CVc) was determined using the criterion by Hernández-Nieto (2002) and a .91 coefficient was obtained, which indicated that the proposed contents had satisfactory validity and concordance. According to the scale established by the author to interpret different coefficient intervals, when the CVc is equal to or higher than .80 and lower than .90 validity and concordance are satisfactory.

An independent sample of 345 Spanish High school students (M = 16.09, SD = 1.43) aged between 14 and 18 was used to validate the basic competences scale. An exploratory factorial analysis was performed (Table 1) using the

method of principle axis factoring with varimax rotation in order to check the first order factor hypothesized. The criterion of varimax rotation focuses on maximum simplification of the vectors column of the factor matrix. Maximum simplification is reached when 1s and 0s exist in one column. The varimax method maximizes the sum of variances of the loadings taken from the factor matrix, and makes it possible to obtain higher loadings and other loadings close to 0. The interest of this rotation is that it permits an easier interpretation of the factors because it indicates a clear positive or negative association between the variable and factor (or an absence of association if the value is close to 0).

The KMO mean for sampling adequacy was .89 and the Bartlett's test of sphericity ($p < .01$) evaluated the applicability of the factorial analysis of the variables studied with a significant model (accepting null hypothesis). After the analysis, the items remained grouped into a single factor with an eigenvalue over 1.00 (4.07) and total explained variance of 45.30%.

In order to confirm the factorial structure obtained, a confirmatory factorial analysis was made

Table 1

Exploratory Factorial Analysis of the Social Competence Scale

Item	Saturation
1. Adequate use of spoken and written Spanish and Valencian	.65
2. Communicate in English to be able to engage in different contexts	.60
3. Use basic mathematical operations and reasoning to solve academic and day to day problems.	.67
4. Analyze, interpret and obtain personal conclusions about health and scientific and technological advances.	.68
5. Make use of technological resources to solve real problems effectively	.66
6. Express my ideas and respect those of others	.70
7. Know and value different cultural or artistic manifestations	.66
8. Continue learning effectively and autonomously on completing my studies, know how to use study techniques adequately	.75
9. Be autonomous and have personal initiative to face challenges and make decisions in my life.	.64
Eigenvalue	4.07
Total variance	45.30%

Table 2

Confirmatory Factorial Analysis. Standard Regression and Error Weight

Item	Regression weight	Error
1. Adequate use of spoken and written Spanish and Valencian	.66	.44
2. Communicate in English to be able to engage in different contexts	.60	.36
3. Use basic mathematical operations and reasoning to solve academic and day to day problems.	.65	.42
4. Analyze, interpret and obtain personal conclusions about health and scientific and technological advances.	.64	.41
5. Make use of technological resources to solve real problems effectively	.72	.33
6. Express my ideas and respect those of others	.68	.51
7. Know about and value different cultural or artistic manifestations	.77	.47
8. Continue learning effectively and autonomously on completing my studies, know how to use study techniques adequately	.72	.60
9. Be autonomous and have personal initiative to face challenges and make decisions in my life.	.66	.44

(Table 2), taking the nine measures observed as a single latent construct (Anderson & Gerbing, 1988). As deviations from multivariate normality are usual in social sciences, a standard procedure of maximum likelihood (ML) was used with Yuan-Bentler corrections (MLR). By using the ML estimation method, the value of χ^2 is increased and that of typical errors is underestimated (Finney & DiStefano, 2006). The measure model was based on the *basic competences* (LOMCE), for which a series of fit indices were considered. Therefore, the indices (Tucker & Lewis, 1973) used to evaluate the goodness of fit of the measure model were: χ^2, χ^2/gl, RMSEA (Root Mean Square Error of Approximation), RMSR (Root Mean Square Residual), and the incremental indices (IFI, CFI and TLI). These fit indices are considered acceptable when χ^2/gl is lower than 5, the incremental indices (NFI, IFI, CFI and TLI) are higher than .90 and the error indices (RMSEA and RMSR) are lower than .05 (Hu & Bentler, 1999).

The standardized factorial weight obtained ranged between .60 and .77, while the item error ranged between .38 and .60. Adequate results were obtained: χ2/gl = 4.67; NFI = .91; CFI = .93; IFI = .93; TLI = .91; RMSEA = .08; SRMR = .04.

Table 3

Mean, Standard Deviation and Correlations of all the Variables

Variable	*M*	*SD*	*R*	α	1	2	3	4	5	6	7
1. Teacher autonomy support	4.24	1.28	1- 7	.87	—	.32**	.24**	.23**	.19**	.30**	.31**
2. Peer autonomy support	5.36	.98	1- 7	.93	—	—	.48**	.42**	.15**	.23**	.23**
3. Mother autonomy support	5.53	1.18	1- 7	.95	—	—	—	.50**	.17**	.29**	.33**
4. Father autonomy support	5.33	1.28	1- 7	.95	—	—	—	—	.12*	.23**	.24**
5. Psychological mediators	3.97	.49	1- 5	.78	—	—	—	—	—	.42**	.36**
6. Academic motivation	4.75	4.06	1- 7	.87	—	—	—	—	—	—	.51**
7. Basic competences	4.50	1.01	1- 7	.88	—	—	—	—	—	—	—

Note. *$p < .05$. **$p < .01$. S = Support.

An analysis of internal consistency was made using Cronbach's alpha. The results showed an alpha coefficient of .88. Composite reliability was .89 and the average variance extracted showed a value of .61.

Descriptive analysis and bivariate correlations

Table 3 shows the mean, the standard deviation and correlations of the variables studied.

The students gave a higher score to *autonomy support from the mother*, followed by *autonomy support from the father, peers and teachers*. The *psychological mediators* showed an average of 3.97. The average for *self-determined academic motivation* index was 4.75. The *basic competences* dimensions showed an average of 4.5. All the variables correlated positively and significantly between each other.

Linear regression analysis

Table 4 shows the linear regression analysis of the basic competences through autonomy support, psychological mediators and self-determined mediators.

In the first step of the linear regression analysis, *basic competences* were positively predicted by *teacher, peer, mother and fa-*

Table 4

Linear Regression Analysis Prediction d Basic Competences through Autonomy Support (Teacher, Peers, Mother, Father, Psychological Mediators and Self-Determined Motivations

	B	*SEB*	*β*	ΔR^2
First step	2.16	.28		.14**
Autonomy Support (teacher, peers, mother, father)	.45	.05	.38**	
Second step	.12	.41		.22**
Autonomy Support (teacher, peers, mother, father)	.37	.05	.31**	
Psychological Mediators	.61	.09	.29**	
Third step	1.44	.41		.32**
Autonomy Support (teacher, peers, mother, father)	.25	.05	.21**	
Psychological Mediators	.33	.09	.16**	
Self-determined Motivation	.09	.01	.37**	

Note. *$p < .05$. **$p < .01$.

ther autonomy support with 14% explained variance. In the second step, the *psychological mediators* were introduced and together with *autonomy support* positively predicted the *basic competences* with 22% of explained variance. In the third step, the *basic competences* were positively predicted by *autonomy support,* the *psychological mediators* and *self-determined motivation* with 32% of explained variance (Table 3).

Discussion

This study analyzed the prediction of *autonomy support, psychological mediators* and *self-determined motivation* on *basic competences*, as well as the validation of the latter scale. With respect to the first aim, the results of the regression analysis revealed that teacher, peer, father and mother *autonomy support*, satisfaction of *basic psychological needs* and *self-determined academic motivation* predicted *basic competences* in students. All the variables positively correlated with each other.

The exploratory and confirmatory factorial analyses showed that the new scale adequately measured the construct "perception of basic competences in Secondary Education.[a]. Construct validity indicated a good fit of the indices to the model with one factor made up of nine items. Internal consistency of the scale was above the recom-

mended value of Cronbach's alpha of .70 (Nunnally & Bernstein, 1994), which indicates that each of the scale responses have a similar measure.

Previous studies (García, De la Torre, De la Villa, Cerezo, & Casanova, 2014; Grolnick, Benjet, Kurowski, & Apostoleris, 1997; Grolnick, Ryan, & Deci,1991; Pérez, Betancort, & Cabrera, 2013; Reeve, Bolt, & Cai, 1999; Vallerand et al., 1997) showed that *teacher and parent autonomy support* related positively to *academic competence* and to high levels of perceived self-determined learning, which relates to a greater sensation of competence and autonomy in students. These results are similar to those where *autonomy support* of students leads to a greater commitment to an initially uninteresting activity, which increases their feelings of self-determination and in turn their intrinsic motivation (Deci, Eghrari, Patrick, & Leona, 1994; Gagne & Deci, 2005; García-Ros, & Pérez-González, 2011; Miñano & Castejón, 2011; Schraw, Flowerday, & Lehman, 2001). In this sense, the perception of academic support provided by social agents (parents, teachers and peers) can positively influence the perception students have about their relationship with others, their competences and autonomy in an academic environment (Nunes, Bodden, Lemos, Lorence, & Jiménez, 2014; Vallerand et al., 1997).

These results open up the possibility of offering students a teaching style based on the joint planning of their autonomy. In this case, a student's motivational orientation is directed towards interest in an activity, and towards regulation of behavior by internal factors, favoring intrinsic motivation and meaningful learning in the development of basic competences (Reeve, Ryan, Deci, & Jang, 2008). The importance that *autonomy support* seems to have in attaining *basic competences* could guide teachers' didactic actions. Joint, directed and coordinated participation of social agents in the educational process becomes even more necessary. In this context, interventions by the department of education and the schools will involve facing new challenges in the development of basic competences to enable the inclusion of social agents in students' educational development.

One of the limitations to be indicated about this study is that the validation of a scale should have continuity over time, the use of different samples and more studies to examine the validity and reliability of these results. Likewise, the factorial structure of the scale should be examined in other educational contexts. Future research should also look into the effects of gender and age on the target factors and the difficulties that teachers have in implementing teaching techniques and strategies that favor a climate of autonomy support through the participation of the social agents in different school subjects.

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